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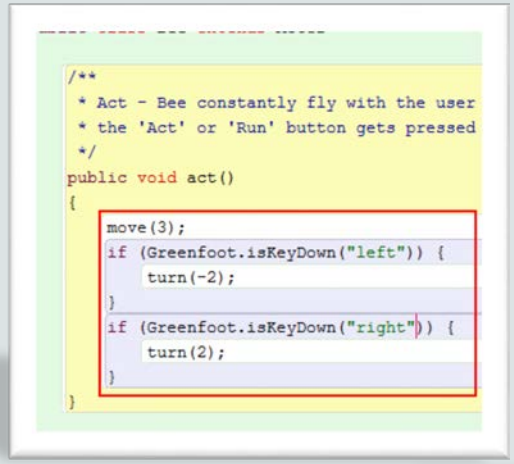
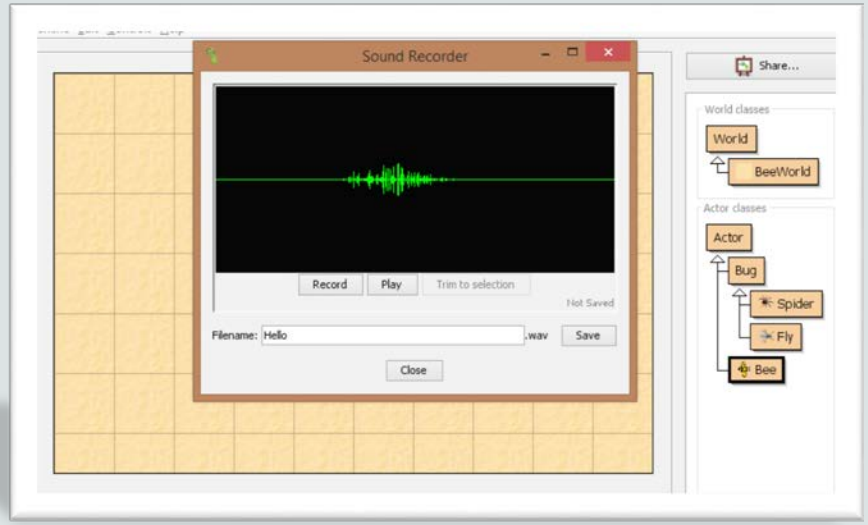
# Java Fundamentals

## 3-7
## Sound and Keyboard Control



```
/**
 * Act - Bee constantly fly with the user
 * the 'Act' or 'Run' button gets pressed
 */
public void act()
{
    move(3);
    if (Greenfoot.isKeyDown("left")) {
        turn(-2);
    }
    if (Greenfoot.isKeyDown("right")) {
        turn(2);
    }
}
```

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# Objectives

This lesson covers the following objectives:

- Write programming statements to include sound in a program
- Write programming statements to include keyboard movements in a program
- Write programming statements to include mouse interaction in a program
- Write programming statements to retrieve information from the user.

# Keyboard Controls

- Games are controlled by a human or computer player using a remote control or keyboard controls.
- To make a scenario behave like a true game, program statements that include keyboard controls so the player can control one or more objects in the game.

# The isKeyDown() Method

- The isKeyDown() method checks if a key on the keyboard has been pressed.
  - Located in the Greenfoot class.
  - Is a static method (associated with a class).
  - Returns true or false value.
  - Expects a String argument in the parameter list.
  - Can be used as a condition in an IF statement.
- Method signature:

```
public static boolean isKeyDown(String key)
```

# String Parameter in isKeyDown() Method

- A String is a piece of text (word or sentence) written in double quotes.
- For example:
  - "This is a String"
  - "A"
  - "name"
- The String parameter in the isKeyDown() method expects the name of the key to press on the keyboard.
- Find a key's name by looking at your keyboard.
  - Sometimes the name isn't evident (right cursor key is called "right").

# Using the isKeyDown() Method Example

This code in the act() method uses the left and right keys on the keyboard to allow the player to control the Bee object's direction as it moves.

```
public class Bee extends Actor
{
    /**
     * Act - Bee constantly fly with the user a
     * the 'Act' or 'Run' button gets pressed i
     */
    public void act()
    {
        move(3);
        if (Greenfoot.isKeyDown("left")) {
            turn(-2);
        }
        if (Greenfoot.isKeyDown("right")) {
            turn(2);
        }
    }
}
```

# Include Sound in Your Game

- Sounds can enhance your game.
  - Give feedback sounds to the player when they win, lose, or achieve minor victories throughout the game.
  - Include background sounds in a game.
- The playSound() method is used to play sounds in a game.
  - Method is located in the Greenfoot class.
  - Parameter list expects the name of a sound file (as String) as an argument.
  - The method does not return data.

# Sound Example

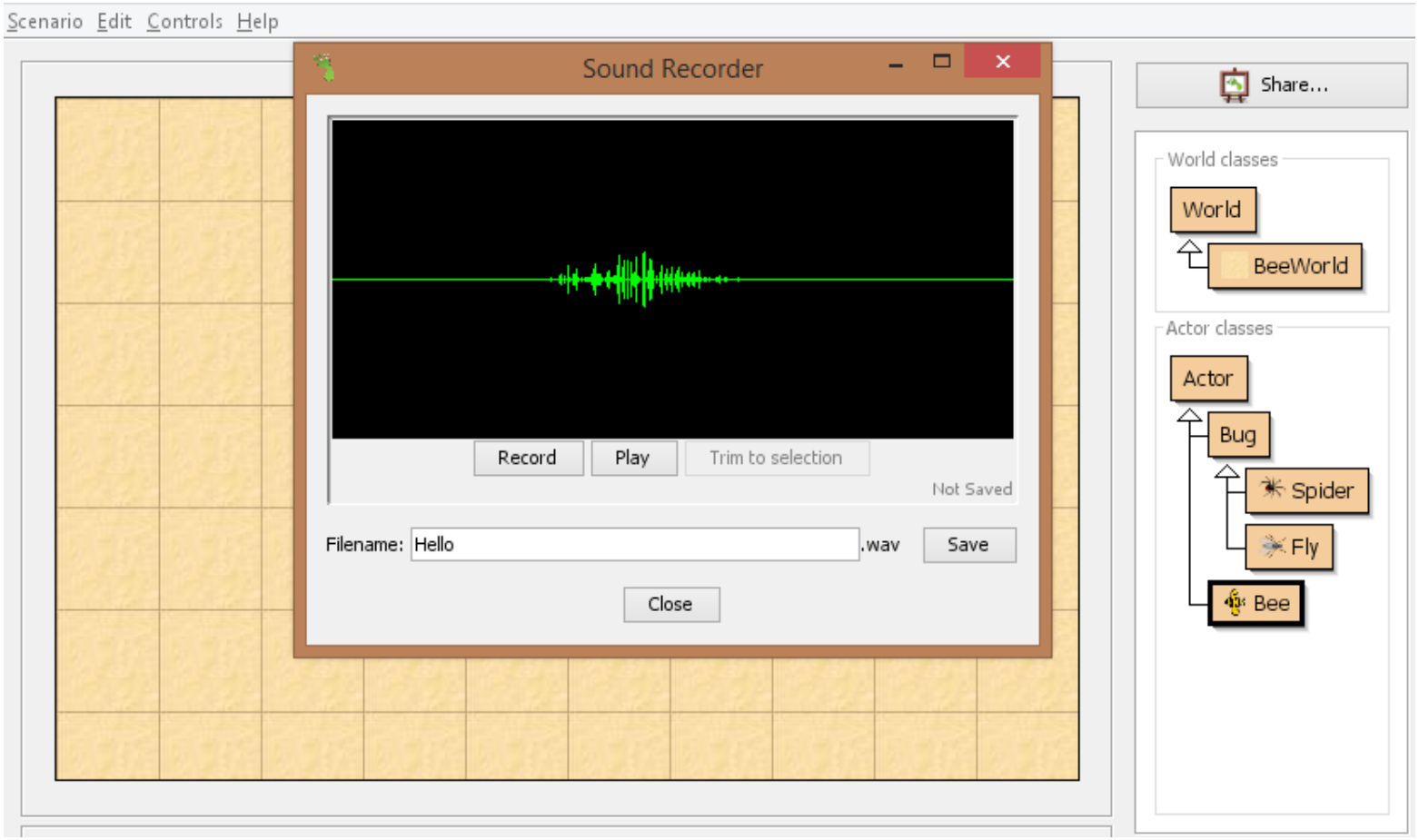
- The playSound() method is called using dot notation in the body of the catchfly() method.
- Whenever the Bee object catches a fly, it makes a sound.

```
/**
 * cathFly.  If the bee touches a fly remove it and play a sound.
 */
 public void catchFly() {
    if (isTouching(Fly.class)) {
        removeTouching(Fly.class);
        Greenfoot.playSound("slurp.wav");
    }
```

# Steps to Record Original Sounds

- In the Controls menu in the environment, select Show Sound Recorder.
- Press Record, then talk into your computer's microphone to record sound.
- Press Stop Recording when finished.
- Press Play to play back the sound.
- Re-record if necessary.
- Enter a file name, then click Save to save the file to the sounds directory of your scenario.
- The file is now ready to reference in your code.

# Greenfoot Sound Recorder Display



# Using the Mouse

- Greenfoot allows multiple input methods rather than just using the keyboard.
- There is also the ability to use controllers, mice and other input devices.
- You may wish to use a mouse within the scenario you are building, rather than the keyboard.
- The Greenfoot class has a number of methods that allow you to get information on the mouse actions.
- These include:
  - getMouseInfo(), mouseClicked(), mouseDraggedEnded(), mouseDragged(), mousePressed()

# Using the Mouse Example

- The scenario we are building does not use mouse controls, but lets show an example.
- If we had an actor called Spider and we wished to detect when the mouse was clicked on an instance of it we would do the following:

```
 if (Greenfoot.mouseClicked(this)) {
    //do something
}
```

# Using the Mouse Example

- If we wanted to detect if the mouse was clicked elsewhere we would use the MouseInfo class.
- Below we see code that would move the current instance to the location where the mouse was clicked.

```
MouseInfo mouse = Greenfoot.getMouseInfo();
 if(mouse!=null){
    if (mouse.getButton() == 1)  {
                  setLocation(mouse.getX(),mouse.getY());
    }
 }
```

# Obtaining Keyboard Input From The User

- There may be a point in your program that you wish to gain input from the user.
- i.e.
  - Asking for their name
  - Asking for a starting speed etc
- From version 2.4.1 of Greenfoot this is now possible through the Greenfoot method called ask()

```
String Greenfoot.ask(String message)
```

# Obtaining Keyboard Input From The User

- The ask() method will display the message as a prompt and obtain the result as a string.
- i.e. Let us ask the user their name and store it in the variable name.
- While Greenfoot is waiting for your response it will pause the world and its actors.

```
String name = Greenfoot.ask("Please input your name: ");
```

- Would produce

# Terminology

Key terms used in this lesson included:

- Keyboard control
- Play Sounds
- Mouse Interaction
- Ask

# Summary

In this lesson, you should have learned how to:

- Write programming statements to include sound in a program
- Write programming statements to include keyboard movements in a program
- Write programming statements to receive the mouse state.
- Write programming statements to retrieve a response from the user.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